CITY OF REDMOND 2003 Washington State Energy Code

Lighting Summary LTG-SUM

2003 Washington State Energy Code Compliance Forms Revised June 2002 - KJM

Project Info	Project Address	Date
		For Building Department Use
	Applicant Name:	
	Applicant Address:	
	Applicant Phone:	

Project Description	☐ New Building ☐ Addition ☐ Alteration ☐ Plans Included Refer to WSEC Section 1513 for controls and commissioning requirements.

Compliance Option	◯ Prescriptive ◯ Lighting Power Allowance ◯ Systems Analysis (See Qualification Checklist (over). Indicate Prescriptive & LPA spaces clearly on plans.)

Alteration Exceptions (check appropriate box)	☐ No changes are being made to the lighting
	☐ Less than 60% of the fixtures are new, and installed lighting wattage is not being increased

Maximum Allowed Lighting Wattage (Interior)

Location (floor/room no.)	Occupancy Description	Allowed Watts per ft^2 **	Area in ft^2	Allowed x Area
	** From Table 15-1 (over) - document all exceptions on form LTG-LPA		Total Allowed Watts	

Notes:
1. Use manufacturer's listed maximum input wattage. For hard-wired ballasts only, the default table in the NREC Technical Reference Manual may also be used
2. Include exit lights unless less than 5 watts per fixture.
3. List all fixtures. For exempt lighting, note exception and leave Watts/Fixture blank.

Proposed Lighting Wattage (Interior)

Location (floor/room no.)	Fixture Description	Number of Fixtures	Watts/ Fixture	Watts Proposed
	Total Proposed Watts may not exceed Total Allowed Watts for Interior		Total Proposed Watts	

Maximum Allowed Lighting Wattage (Exterior)

Location	Description	Allowed Watts per ft^2 or per lf	Area in ft^2 (or lf for perimeter)	Allowed Watts x ft^2 (or x lf)
Covered Parking (standard paint)		0.2 W/ft^2		
Covered Parking (reflective paint)		0.3 W/ft^2		
Open Parking		0.2 W/ft^2		
Outdoor Areas		0.2 W/ft^2		
Bldg. (by facade)		0.25 W/ft^2		
Bldg. (by perim)		7.5 W/lf		
Note: for building exterior, choose either the facade area or the perimeter method, but not both)			Total Allowed Watts	

Proposed Lighting Wattage (Exterior)

Use mfgr listed maximum input wattage. For fixtures with hard-wired ballasts only, the default table in the NREC Technical Reference Manual may also be used.

Location	Fixture Description	Number of Fixtures	Watts/ Fixture	Watts Proposed
	Total Proposed Watts may not exceed Total Allowed Watts for Exterior		Total Proposed Watts	

Lighting Summary (back) LTG-SUM

Prescriptive Spaces	Occupancy:	◯ Warehouses, storage areas or aircraft storage hangers ◯ Other
Qualification Checklist Note: If occupancy type is "Other" and fixture answer is checked, the number of fixtures in the space is not limited by Code. Clearly indicate these spaces on plans. If not qualified, do LPA Calculations.	Lighting Fixtures:	☐ Check here if at least 95% of fixtures in the space meet all four criteria: 1. Fixtures are fluorescent, non-lensed, with only one or two lamps, and 2. Lamps are T-1, T-2, T-4, T-5, T-6, T-8 3. Lamps are 5-50 Watts, and 4. Ballasts are electronic ballasts 5. Exit lights < 5 watts/fixture 6. Screw-in compact fluorescent fixtures do not qualify

TABLE 15-1 Unit Lighting Power Allowance (LPA)

Use[1]	LPA[2] (W/sf)	Use[1]	LPA[2] (W/sf)
Painting, welding, carpentry, machine shops	2.3	Police and fire stations[8]	1.5
Barber shops, beauty shops	2.0	Atria (atriums)	1.0
Hotel banquet/conference/exhibition hall[3,4]	2.0	Assembly spaces[9], auditoriums, gymnasia[9], heaters	1.0
Laboratories	2.0	Group R-1 common areas	1.0
Aircraft repair hangars	1.5	Process plants	1.0
Cafeterias, fast food establishments[5]	1.5	Restaurants/bars[5]	1.0
Factories, workshops, handling areas	1.5	Locker and/or shower facilities	0.8
Gas stations, auto repair shops[6]	1.5	Warehouses[11], storage areas	0.5
Institutions	1.5	Aircraft storage hangars	0.4
Libraries[5]	1.5	Retail[10], retail banking	1.5
Nursing homes and hotel/motel guest rooms	1.5	Parking garages	See Section 1532
Wholesale stores (pallet rack shelving)	1.5		
Mall concourses	1.4	**Plans Submitted for Common Areas Only[7]**	
Schools buildings (Group E occupancy only), school classrooms, day care centers	1.35	Main floor building lobbies[3] (except mall concourses)	1.2
Laundries	1.3	Common areas, corridors, toilet facilities and washrooms, elevator lobbies	0.8
Office buildings, office/administrative areas in facilities of other use types (including but not limited to schools, hospitals, institutions, museums, banks, churches)[5,7,11]	1.2		

Footnotes for Table 15-1

1) In cases in which a general use and a specific use are listed, the specific use shall apply. In cases in which a use is not mentioned specifically, the Unit Power Allowance shall be determined by the building official. This determination shall be based upon the most comparable use specified in the table. See Section 1512 for exempt areas.
2) The watts per square foot may be increased, by two percent per foot of ceiling height above twenty feet, unless specifically directed otherwise by subsequent footnotes.
3) Watts per square foot of room may be increased by two percent per foot of ceiling height above twelve feet.
4) For all other spaces, such as seating and common areas, use the Unit Light Power Allowance for assembly.
5) Watts per square foot of room may be increased by two percent per foot of ceiling height above nine feet.
6) Includes pump area under canopy.
7) In cases in which a lighting plan is submitted for only a portion of a floor, a Unit Lighting Power Allowance of 1.35 may be used for usable office floor area and 0.80 watts per square foot shall be used for the common areas, which may include elevator space, lobby area and rest rooms. Common areas, as herein defined do not include mall concourses.
8) For the fire engine room, the Unit Lighting Power Allowance is 1.0 watts per square foot.
9) For indoor sport tournament courts with adjacent spectator seating, the Unit Lighting Power Allowance for the court area is 2.6 watts per square foot.
10) Display window illumination installed within 2 feet of the window, lighting for free-standing display where the lighting moves with the display, and building showcase illumination where the lighting is enclosed within the showcase are exempt.

    An additional 1.5 w/ft^2 of merchandise display luminaires are exempt provided that they comply with all three of the following:

    a) located on ceiling-mounted track or directly on or recessed into the ceiling itself (not on the wall).
    b) adjustable in both the horizontal and vertical axes (vertical axis only is acceptable for fluorescent and other fixtures with two points of track attachment).
    c) fitted with tungsten halogen, fluorescent, or high intensity discharge lamps.

    This additional lighting power is allowed only if the lighting is actually installed.
11) Provided that a floor plan, indicating rack location and height, is submitted, the square footage for a warehouse may be defined, for computing the interior Unit Lighting Power Allowance, as the floor area not covered by racks plus the vertical face area (access side only) of the racks. The height allowance defined in footnote 2 applies only to the floor area not covered by racks.

Lighting Power Allowance Adjustments LTG-LPA

Project Address		Date

Use this form if you are claiming any ceiling height adjustments for your Lighting Power Allowances for interior lighting. The Occupancy Description should agree with the "Use" listed on Code Table 15-1. Identify the appropriate Ceiling Height Limit (9 feet, 12 feet or 20 feet) on which the adjustment is based. The Adjusted LPA is calculated from this number and from the Allowed Watts per ft^2. Carry the Adjusted LPA to the corresponding "Allowed Watts per ft^2" location on LTG-SUM.

Adjusted Lighting Power Allowances (Interior)

Location (floor/room no.)	Occupancy Description	Allowed Watts per ft^2 **	Ceiling Height for this room	Ceiling Height limit for this exception**	Adjusted LPA Watts per ft^2

** From Table 15-1 based on exceptions listed in footnotes

Lighting Permit Plans Checklist LTG-CHK

2003 Washington State Energy Code Compliance Forms Revised June 2002 - KJM

Project Address	Date

The following information is necessary to check a lighting permit application for compliance with the lighting requirements in the 1994 Washington State Nonresidential Energy Code.

Applicability (yes, no, n.a.)	Code Section	Component	Information Required	Location on Plans	Building Department Notes
LIGHTING CONTROLS (Section 1513)					
	1513.1	Local control/access	Schedule with type, indicate locations		
	1513.2	Area controls	Maximum limit per switch		
	1513.3	Daylight zone control	Schedule with type and features, indicate locations		
		vertical glazing	Indicate vertical glazing on plans		
		overhead glazing	Indicate overhead glazing on plans		
	1513.4	Display/exhib/special	Indicate separate controls		
	1513.5	Exterior shut-off	Schedule with type and features, indicate location		
		(a) timer w/backup	Indicate location		
		(b) photocell.	Indicate location		
	1513.6	Inter. auto shut-off	Indicate location		
	1513.6.1	(a) occup. sensors	Schedule with type and locations		
	1513.6.2	(b) auto. switches	Schedule with type and features (back-up, override capability); Indicate size of zone on plans		
4	1513.7	Commissioning	Indicate requirements for lighting controls commissioning		
n.a.		Lighting Sum. Form	Completed and attached. Schedule with fixture types, lamps, ballasts, watts per fixture		
		Elec motor efficiency	MECH-MOT or Equipment Schedule with hp, rpm, efficiency		

If "no" is circled for any question, provide explanation:

Lighting Permit Plans Checklist LTG-CHK

Lighting - General Requirements

1513 Lighting Controls. Lighting, including exempt lighting in Section 1512, shall comply with this section. Where occupancy sensors are cited, they shall have the features listed in Section 1513.6.1. Where automatic time switches are cited, they shall have the features listed in Section 1513.6.2.

1513.1 Local Control and Accessibility: Each space, enclosed by walls or ceiling-height partitions, shall be provided with lighting controls located within that space. The lighting controls, whether one or more, shall be capable of turning off all lights within the space. The controls shall be readily accessible, at the point of entry/exit, to personnel occupying or using the space.

EXCEPTIONS: The following lighting controls may be centralized in remote locations:

1. Lighting controls for spaces which must be used as a whole.
2. Automatic controls.
3. Controls requiring trained operators.
4. Controls for safety hazards and security.

1513.2 Area Controls: The maximum lighting power that may be controlled from a single switch or automatic control shall not exceed that which is provided by a twenty ampere circuit loaded to not more than eighty percent. A master control may be installed provided the individual switches retain their capability to function independently. Circuit breakers may not be used as the sole means of switching.

EXCEPTIONS:

1. Industrial or manufacturing process areas, as may be required for production.
2. Areas less than five percent of footprint for footprints over 100,000 square feet.

1513.3 Daylight Zone Control: All daylighted zones, as defined in Chapter 2, both under overhead glazing and adjacent to vertical glazing, shall be provided with individual controls, or daylight-or occupant-sensing automatic controls, which control the lights independent of general area lighting.

Contiguous daylight zones adjacent to vertical glazing are allowed to be controlled by a single controlling device provided that they do not include zones facing more than two adjacent cardinal orientations (i.e. north, east, south, west). Daylight zones under overhead glazing more than 15 feet from the perimeter shall be controlled separately from daylight zones adjacent to vertical glazing.

EXCEPTION:

Daylight spaces enclosed by walls or ceiling height partitions and containing 2 or fewer light fixtures are not required to have a separate switch for general area lighting.

1513.4 Display, Exhibition, and Specialty Lighting Controls: All display, exhibition, or specialty lighting shall be controlled independently of general area lighting.

1513.5 Automatic Shut-Off Controls, Exterior: Exterior lighting not intended for 24-hour continuous use shall be automatically switched by timer, photocell, or a combination of timer and photocell. Automatic time switches must also have program back-up capabilities, which prevent the loss of program and time settings for at least 10 hours, if power is interrupted.

1513.6 Automatic Shut-Off Controls, Interior: Office buildings greater than 5,000 sq. ft. and all school classrooms shall be equipped with separate automatic controls to shut off the lighting during unoccupied hours. Automatic controls may be an occupancy sensor, time switch, or other device capable of automatically shutting off lighting.

EXCEPTIONS:

1. Areas that must be continuously illuminated, or illuminated in a manner requiring manual operation of the lighting.
2. Emergency lighting systems.
3. Switching for industrial or manufacturing process facilities as may be required for production.

1513.6.1 Occupancy Sensors: Occupancy sensors shall be capable of automatically turning off all the lights in an area, no more than 30 minutes after the area has been vacated.

1513.6.2 Automatic Time Switches: Automatic time switches shall have a minimum 7 day clock and be capable of being set for 7 different day types per week and incorporate an automatic holiday "shut-off" feature, which turns off all loads for at least 24 hours and then resumes normally scheduled operations. Automatic time switches shall also have program back-up capabilities, which prevent the loss of program and time settings for at least 10 hours, if power is interrupted.

Automatic time switches shall incorporate an over-ride switching device which:

a) is readily accessible;
b) is located so that a person using the device can see the lights or the areas controlled by the switch, or so that the area being illuminated is annunciated; and
c) is manually operated;
d) allows the lighting to remain on for no more than two hours when an over-ride is initiated; and
e) controls an area not exceeding 5,000 square feet or 5 percent of footprint for footprints over 100,000 square feet, whichever is greater.

1513.7 Commissioning Requirements: For lighting controls which include daylight or occupant sensing automatic controls, automatic shut-off controls, occupancy sensors, or automatic time switches, the lighting controls shall be tested to ensure that control devices, components, equipment and systems are calibrated, adjusted and operate in accordance with approved plans and specifications. Sequences of operation shall be functionally tested to ensure they operate in accordance with approved plans and specifications. A complete report of test procedures and results shall be prepared and filed with the owner. Drawing notes shall require commissioning in accordance with this paragraph.